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(58) Field of search

G2J

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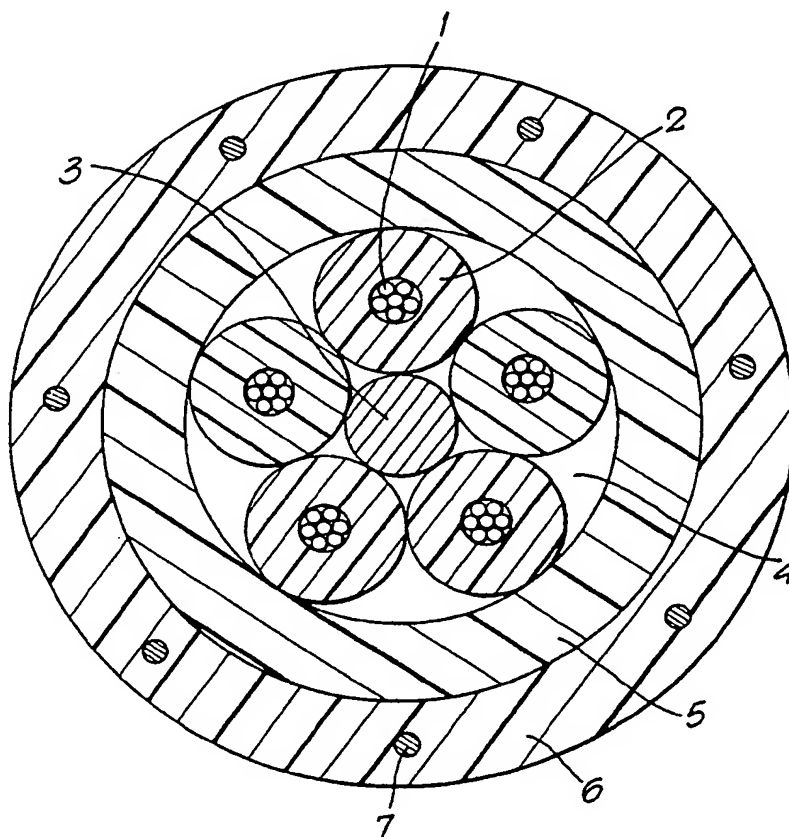
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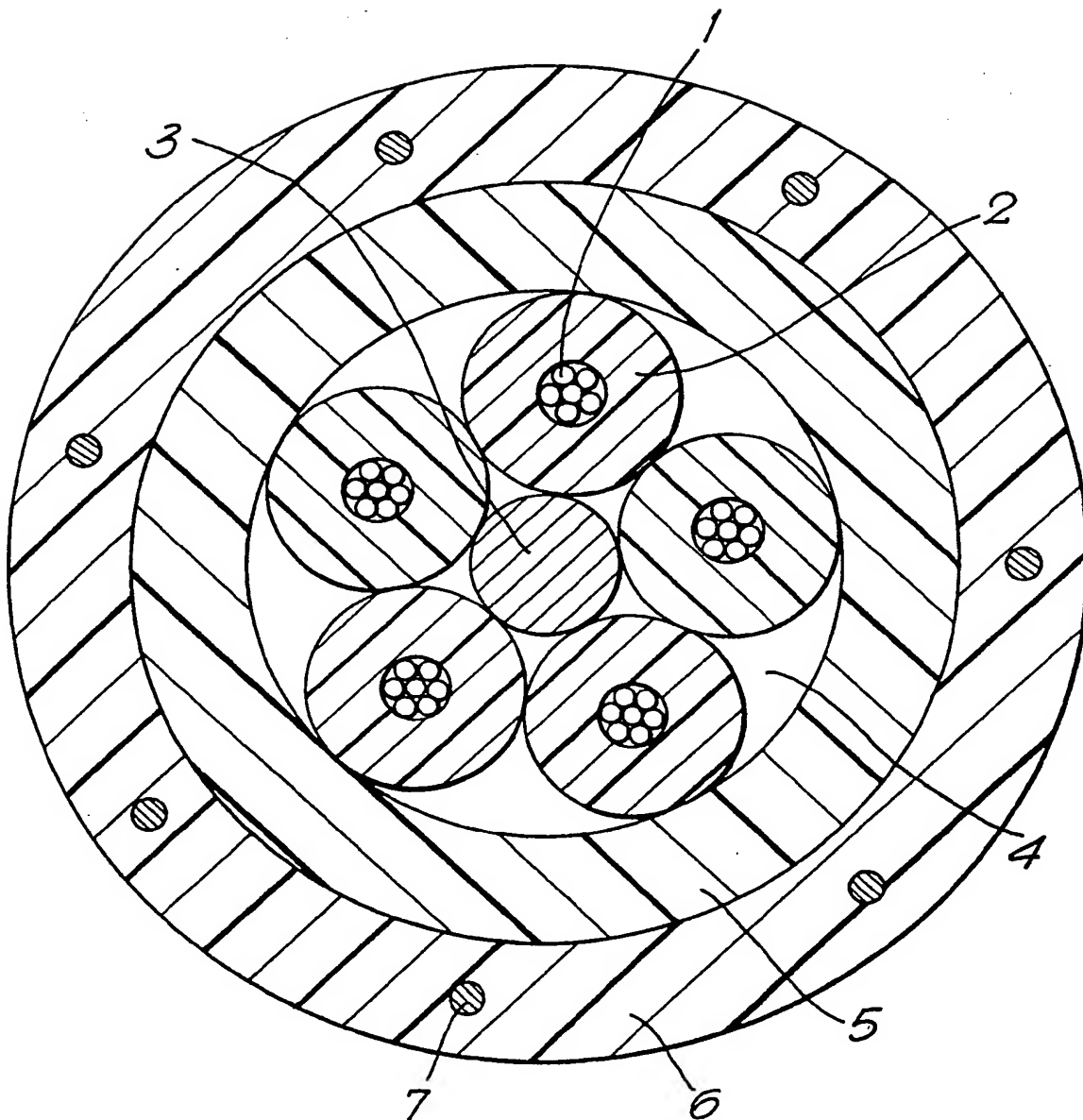
(54) Optical fibre cables

(57) An optical cable in which a bundle of optical fibres (1) is enclosed within a cushion sheath (2) of foamed plastic and surrounded by a plastics strengthening sheath (6) which may contain strength members (7). Several of such cushioned bundles of fibres may be S/Z stranded around a central strength member (3) and the optical fibres within each cushion sheath may themselves be stranded. A further foamed plastics sheath (5) may be interposed between the cushioned bundle and strengthening sheath and a water-blocking medium may fill the interstices therebetween.



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## SPECIFICATION

## Optical fibre cables

- 5 This invention relates to optical fibre cables and particularly to such cables for local wide band or short haul applications.

Thus, the invention provides an optical fibre cable including at least one cushioned fibre bundle comprising a bundle of optical fibres surrounded by a cushion sheath of foamed plastic material, and a further strengthening sheath of plastic material surrounding said at least one cushioned fibre bundle.

- 15 In a preferred embodiment, a plurality of cushioned fibre bundles are stranded together within said strengthening sheath possibly with a further layer of foamed plastic material between said cushioned fibre bundles and said strengthening sheath. The cushioned fibre bundles may be stranded together in any desired way, for example, longitudinally, helically, or in S/Z formation, which means helically wound with a periodic reversal of the direction of winding as is known from e.g. GB 1598536. They may also be stranded around a central strength member in suitable cases.

Preferably, the optical fibres within a cushioned fibre bundle are themselves stranded in an S/Z formation and may be held together at intervals by a fastening means such as a binding tape.

The cushion sheath of foamed plastic material may be extruded around the optical fibre bundle or may be applied as a tape either longitudinally or helically.

The strengthening sheath likewise may be extruded around the cushioned fibre bundle(s) or may be applied as a tape either longitudinally or helically, and may be applied either tightly around the cushioned fibre bundle(s) or loosely allowing the cushioned fibre bundle(s) to be slack within the strengthening sheath.

45 The strengthening sheath is preferably made of nylon but any other material with adequate strength and a low friction surface may be used.

The strengthening sheath may have longitudinal strengthening members such as steel, Kevlar or glass fibres embedded within it and further sheaths having various properties with or without strengthening members may also surround said at least one cushioned fibre bundle.

The interstices between the cushioned fibre bundles and the surrounding sheaths may have a water blocking medium such as petroleum jelly within them, if desired.

60 One embodiment of the invention will now be more fully described by way of example with reference to the drawing which shows an optical fibre cable according to the invention.

Thus, bundles of optical fibres 1 are surrounded by sheaths 2 of foamed plastic ma-

terial, such as polyurethane, five such bundles being shown in the drawing. The optical fibres are stranded in S/Z formation within the sheath 2 and are bound together at intervals along their length by a strip of Kevlar (not shown). The cushioned bundles are, in turn, stranded in S/Z formation around a central strength member 3, the interstices 4 between the sheathed bundles being filled with a water repellent gel such as petroleum jelly.

This structure of stranded cushioned bundles is itself protected by a further sheath 5 of foamed plastic material which is tightly wrapped by yet a further sheath 6 of polyethylene which has longitudinal strength members 7 embedded within it, and may be followed by a further sheath of nylon.

## CLAIMS

- 85 1. An optical fibre cable including at least one cushioned fibre bundle comprising a bundle of optical fibres surrounded by a cushion sheath of foamed plastic material, and a further strengthening sheath of plastic material surrounding said at least one cushioned fibre bundle.
- 90 2. An optical fibre cable according to Claim 1 having a plurality of cushioned fibre bundles stranded together within said strengthening sheath.
- 95 3. An optical fibre cable according to Claim 2 wherein said cushioned fibre bundles are stranded together either longitudinally, helically or in S/Z formation.
- 100 4. An optical fibre cable according to either Claim 2 or Claim 3 further including a further layer of foamed plastic material between said stranded plurality of cushioned fibre bundles and said strengthening sheath.
- 105 5. An optical fibre cable according to any preceding claim further including a central strength member around which the cushioned fibre bundle or bundles is/are stranded.
- 110 6. An optical fibre cable according to any preceding claim wherein the optical fibres within the or each cushioned fibre bundle are themselves stranded together.
- 115 7. An optical fibre cable according to Claim 6 wherein the optical fibres are held together at intervals by fastening means.
8. An optical fibre cable according to any preceding claim wherein said cushion sheath is extruded around the respective optical fibre bundle.
- 120 9. An optical fibre cable according to any one of Claims 1 to 7 wherein said cushion sheath is applied as a tape, either longitudinally or helically, around the respective optical fibre bundle.
- 125 10. An optical fibre cable according to any preceding claim wherein said strengthening sheath is extruded around the cushioned fibre bundle or bundles.
- 130 11. An optical fibre cable according to any one of Claims 1 to 9 wherein said

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strengthening sheath is applied as a tape, either longitudinally or helically, around the cushioned fibre bundle or bundles.

12. An optical fibre cable according to  
5 any preceding claim wherein said strengthening sheath is applied tightly around the cushioned fibre bundle or bundles.
13. An optical fibre cable according to  
10 any one of Claims 1 to 11 wherein said strengthening sheath is applied loosely around the cushioned fibre bundle or bundles allowing it or them to be slack within the strengthening sheath.
14. An optical fibre cable according to  
15 any preceding claim wherein said strengthening sheath is of nylon.
15. An optical fibre cable according to  
20 any preceding claim wherein the strengthening sheath has longitudinal strength members embedded within it.
16. An optical fibre cable according to  
25 any preceding claim wherein the interstices between the bundle or bundles and the strengthening sheath have a water-blocking medium therein.
17. An optical fibre cable substantially as hereinbefore described with reference to the drawing.

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